Section 1 - Identification of the substance / preparation and of the company / undertaking:

Identification of the product
Product Name: Copper Anodes

Use of the Substance / Preparation
Industrial Used in the plating process.

Function of the Substance / Preparation
Used in Electrical and Architectural Industry

Operational Area
Industrial processing.

Company / undertaking identification
The Brock Metal Company Limited
Walsall Road,
Norton Canes,
Cannock,
Staffordshire.
WS11 9NR
Tel: (01543) 276666
Fax (01543) 276418
Email – sales@brock-metal.co.uk
Web Site – www.brockmetal.com

Form: Ovals, Anodes, Slugs.

Section 2 - Hazardous Information:
Not classified as hazardous

Section 3 - Chemical Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>Concentration %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>99.999 max</td>
</tr>
<tr>
<td>Phosphorous</td>
<td>7723-14-0</td>
<td>0.06 max</td>
</tr>
</tbody>
</table>

Section 4 - Exposure Scenarios and First Aid Measures.

First Aid Measures
Inhalation Remove victim from exposure to processing fumes or dusts to fresh air. Seek medical attention immediately.

Ingestion: Not regarded as a normal occupational hazard. Do not induce vomiting – Seek medical attention immediately if large quantities of dust or fume are ingested.

Skin Contact: If dust, remove contaminated clothing and wash effected area with soap and water. Seek medical attention if irritation persists. Molten Metal – flood contact area to solidify and cool but do not attempt to remove encrusted metal on skin or clothing. Continue to flush for at least 10 minutes. Seek further medical attention immediately.

Eyes: If dust enters eyes flush for 10 – 20 minutes with cold water. Seek medical attention if required.

Updated 03 February 2015
Section 5 - Fire Fighting Measures

Copper is not flammable. However in the form of Dust the explosion hazard is slight when exposed to flame.

5.1 Suitable Extinguishing Media
Foam, Carbon Dioxide (CO₂), dry chemicals

5.2 Extinguishing media which must not be used for safety reasons.
Water with Molten copper.

5.3 Other Instructions
Explosion hazards: Molten Copper explodes on contact with water. Copper also forms a potentially explosive reaction with the following substances: acetylene compounds, ammonium nitrate, 3-bromopropyne, ethylene oxide and lead acid.

Section 6 - Accidental Release Measures:

6.1 Personal precautions
Wear gloves and approved respiratory protection if possibility of dust, mist and fume exposure exits.

6.2 Environmental precautions
Copper-containing waste is normally collected to recycle copper. Should waste disposal be deemed necessary, follow national or local regulations.

6.3 Methods for cleaning up.
Do not use compressed air for cleaning

6.4 Other Instructions
Shut off all sources of ignition. If dust is released sweeping is preferred. Place material in closed containers.

Section 7 - Handling and Storage:

7.1 Handling
Do not breathe dust or smoke. Avoid activities that raise dust or smoke. Avoid contact with the eyes and skin. Wash hands thoroughly after handling.

7.2 Storage
To be stored in normal dry warehouse

Section 8 – Exposure Controls / Personal Protection

Provide sufficient ventilation to maintain the concentration of dust below the admissible limit values.

8.1.1 HTP Values
Cu 1 mg/m³

8.1.2 Other limit values
OSHA (8h TWA)
Dust and Mist as Cu 1 mg/m³
Copper Fume 0.1 mg/m³
Tellurium 0.1 mg/m³

ACGIH (8h TWA)
Dust and Mist as Cu 1 mg/m³
Copper Fume 0.2 mg/m³
Phosphorous 0.1 mg/m³

8.1.3 Limit values in other countries
Updated 03 February 2015
8.2 Exposure Controls

8.2.1 Occupational exposure controls
When handling molten copper, protective clothing against melt splashing, face shield, protective gloves and respirator if needed must be used. Avoid ingestion and inhalation of dust and fumes. Do not eat, drink or smoke during use and wash hands before eating, drinking or smoking.

8.2.2 Respiratory protection
NIOSH/MSHA approved respirator for dust, fume and mist.

8.2.3 Hand protection
Protective gloves against metal splashes

8.2.4 Eye protection
Safety glasses or face shield in exposure to dust, fume or mist.

8.2.5 Skin protection
Protective clothing against melt splashing. Wear trouser legs outside boots to avoid entrance in the boots.

### Section 9 - Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>Solid form</td>
</tr>
<tr>
<td>Appearance</td>
<td>Reddish gold, bronze.</td>
</tr>
<tr>
<td>Odour</td>
<td>None in solid form</td>
</tr>
<tr>
<td>pH Value</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Melting Point</td>
<td>1051 °C</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>Pure copper 2595 °C</td>
</tr>
<tr>
<td>Vapour Pressure</td>
<td>Negligible @ 20°C</td>
</tr>
<tr>
<td>Density</td>
<td>7.6-8.95 g/cm³ approx – dependent on the alloy.</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Insoluble</td>
</tr>
</tbody>
</table>

### Section 10 – Stability and Reactivity Data

Copper and Copper alloys are stable under normal conditions.

**Incompatibilities:** Acetylene compounds, ammonia, ammonium chloride, ammonium hydroxide, ammonium nitrate, black liquor, 3-bromopropyne, chlorine (moist) chronic acid, copper chloride, copper nitrate, ethylene oxide, ferric chloride, ferric sulphate, hydrocyanic acid, hydrogen peroxide (>10%), hydrogen sulphide, lead acid, lime sulphur, mercury or its salts, nitric acid, potassium cyanide, potassium dichromate, silver salts, sodium cyanide, sodium dichromate, sodium sulphide, sodium thiosulphate, sulphur (molten), sulphur chloride.

**Hazardous Decomposition Products:** Copper and Copper alloys may produce an explosive reaction with the following substances: acetylene compounds, ammonium nitrate, 3-bromopropyne, ethylene oxide and lead acid. At temperature above melting point metallic oxide fumes may be evolved. When welding and brazing, dust and fume may also be mitted. Metal machining and grinding operations may produce fine particles and dust.

### Section 11 – Toxicological Information:

11.1 Irritation and corrosiveness
Possibility of irritation of the bowels by swallowing, the eyes, skin and mucus membranes.

11.2 Sensitisation
Copper is not classified as a sensitative agent.

11.3 Sub-acute, sub-chronic and prolonged toxicity
Prolonged or repeated exposure to copper fumes or dusts may cause hemolysis, raising of the blood pressure and damage to kidney and liver.

11.4 Empirical data on effects on humans
Copper fumes or dusts may result in respiratory tract irritation, metal fume fever, shivers, metal taste in mouth headache. Smoke may be irritating to skin and mucous membrane.

Updated 03 February 2015
Section 12 - Ecological Information:

12.1 Ecotoxicity

12.1.1 Aquatic toxicity

12.1.2 Toxicity to other organisms

12.2 Mobility

12.3 Persistence and degradability.

12.3.1 Biodegradation

12.3.2 Chemical degradation

12.4 Bioaccumulative Potential

12.5 Other adverse effects

Section 13 - Disposal Considerations:

Product

The material is 100% recyclable. If material cannot be returned to process or salvage, dispose of in accordance with applicable local regulations.

Section 14 - Transportation Information:

Copper is not classified as hazardous for transport.

Section 15 – Regulatory Information

Ingredients Listed on the European Inventory of Existing Commercial Chemical Substances (EINECS) - Yes

EU Classification - Not applicable.

Labelling according to EC Directives:

None Specific

Section 16 – Other Information

This information has been compiled based on the present state of our knowledge and as completely and accurately as possible based on the normal usage of the material. However, all information is given without warranty of representation and is intended solely for your own investigation and verification. It is not possible to identify all hazards associated with the use of this product and we disclaim any liability for damages arising out of or related to the information provided.